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EFFECT OF STRUCTURED TEACHING ON DISASTER PREPAREDNESS AND MANAGEMENT AMONG NURSES IN KERALA

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ABSTRACT

Disasters pose unique challenge for every medical care facility in terms of infrastructure, capacity, and preparedness. World Health Organization stresses that healthcare workers need to be prepared for a disaster. Nurses are the largest manpower group in the health care team they need to be trained to equip with the competencies required during disasters to rescue life and safeguard the health of the individuals and communities affected by crisis. Aim: This study was aimed to evaluate the effectiveness of structured teaching programme on disaster preparedness and management among the nurses in Disaster Prone area district of Kerala Research approach adopted for this study was Quantitative study approach. The research design adopted for present study was quasi experimental (one group pre-test post-test design) and the samples were selected by the using purposive sampling technique. And 400 samples were selected from Healthcare Facility of hospitals, nursing colleges and schools The tool consisted of demographic variable details of training programmes that the nursing personnel attended, knowledge questionnaire on types of disaster, and role of nurses regarding disaster management and prevention. The researcher prepared a structured Educational interventional programme, used variety of teaching methods like Lecture, Discussion, Videos, power point presentation and Educational Booklet were distributed to the participants and to the Institution. Descriptive and inferential statistics such as frequency, mean, chi-square, and Pearson's correlation were used for data analysis. The demographic profile of the staff revealed that majority between 307(76.8%) belonged to 21 to 30yrs of age, were 188(47.0%) were BSc Nurses, 188(47.0%) and 319(79.8%), working as staff nurses or as nursing Tutor and majority of the subject 284(71%) were married. Findings: The present study findings have revealed comparing pre test scores the post-test mean score, standard deviation was found highly significant, after the educational interventional programmes with the significant p value at (0.001) level. From the study results there was statistically significant differences in all items of disaster management among study subjects There was an statistically significant association between the education and role of the nurses regarding disaster management and prevention (p=07** at 1 % level), association between the marital status and awareness of earthquake 0. (2 tailed test of 0.048,0.045P Value<0.05 * at 5 % level) and there was association between the occupation nurses with Tsunami and prevention strategy (p =0.016, P Value<0.05).There was no statistically significant association between the age and awareness regarding various disaster characters.(P value>0.05) Conclusion: The Educational Intervention programme regarding disaster preparedness and management was founded very effective and will nurses to save lives and also to serve as ready Manpower at the time of disaster in preserving the livelihood.

Key words: Educational/structured teaching programme, Disaster aspects, role of nurses on preparedness and management.

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INTRODUCTION

Natural disasters continue to strike unabated and without notice and are perceived to be on increase in their magnitude, complexity, frequency and economic impact globally.[1]

Disasters can be seen as sudden and terrible events causing great damage, loss or destruction. Disasters have been defined as ecologic troubles or severe and high-magnitude emergencies resulting in deaths, injuries, illnesses and profound damages that cannot be successfully managed using ordinary procedures or resources and require external support. Disasters can be divided into three categories; natural events- such as storms, drought, earthquakes, disease epidemic, technological events-such as explosions, structure collapse, radiological accidents, civil/political events- such as strikes, terrorism, and biological warfare[2]

Nurses have been part of disaster preparedness and response as long as nurses have existed. Nurses have special role in advocating systematic profit-driven health care services during disaster. Nurses are needed for prevention, surveillance and response of every type. Nurses are routinely assigned to assist in triage and screening for health problems, administration of first aid, psychological support, implementation of infection control procedures, and monitoring so that the congregate living situation does not lead to an outbreak of disease. They have always been key players during epidemic situations by performing contact tracing and conducting case investigations, engaging in surveillance and reporting, collecting specimens, administering immunizations, and educating the community. Hence nurses are key staff members behind the rapid establishment of refugee camps for those who need shelter.[3]

With increase frequency of disaster happenings globally, the need for education & training preparation is to be emphasized. A set of core competencies has also been defined as a starting point for delineating expected competency of health professionals in disaster medicine & public health. Nurses should be well adequately prepared with knowledge and skills for management of disasters, starting early from their basic training & reinforcement in their on- the- job continuing training. Nurses, in all specialties, should be equipped for all competencies for disaster prevention, preparedness, and response& recovery phases. The educational activities and training attended by the nurses in preparation for their performance of functions during disaster situations. The fundamental goal of nursing, to assist individuals to their highest possible level of functioning in the face of health and illness challenges, is never more needed than under emergency conditions.[4]

BACKGROUND

Disasters are a part of everyday life and they are increasing. Nowhere are they increasing faster and with greater ferocity than in Asia Pacific, the world's most disaster-prone region where, on average, 40 per cent of the globe's "natural "catastrophes occur (IFRC, 2010). According to the World Disaster Report 2006, fifty eight percent of the total number of people killed in natural disasters during the decade 1996-2005 was from the South East-Asia (SEA) countries. In 2005, three countries of the SEA Region (India, Bangladesh and Indonesia) were among the top-10 countries most affected by natural disasters (WHO, 2007). In the last two decades, 38% of all the global disasters have occurred in the countries of the South-East Asia Region. Almost two thirds (61%) of the deaths due to disasters globally have been reported from the SEA region during 1998-2008.[5, 6] In the last two decades, 38% of all the global disasters have occurred in the countries of the South-East Asia Region. Almost two thirds (61%) of the deaths due to disasters globally have been reported from the SEA region during 1998-2008. (Knight, 2008).[7]

From 1998 to 2008, nearly 1 million people lost their lives to disasters, 3.3 million were injured and 2 billion were affected. Health systems, including human resources and physical infrastructures, though essential for population survival are very vulnerable to major emergencies and disasters (WHO/ICN, 2009)[8.]

Earthquakes, Volcanic eruptions, Armed conflicts, Tsunamis, Tornados, Droughts, Famine, Tropical cyclones, Floods and Landslides. Disasters are a part of everyday life and they are increasing. Nowhere are they increasing faster and with greater ferocity than in Asia Pacific, the world's most disaster-prone region where, on average, 40 per cent of the globe's "natural "catastrophes occur (IFRC, 2010). [9] Over 8% Indian area of 40 million hectares is prone to floods, and the average area affected by floods annually is about 8 million hectares. Of the nearly 7,500 kilometers long coastline, approximately 5,700 kilometers is prone to cyclones, and 68% area is susceptible to drought. Disasters are no longer limited to natural catastrophes. Man-made emergencies also cause disasters in terms of fatalities and economic losses. With urbanization and concentration of population in metropolitan cities, more and more people are becoming vulnerable to location disasters (Planning Commission 2008, Vol. 1, 207)[10]

Hazards in India are spread throughout the country. In one part of the country there could be heat wave, while at the same time in another part there could be cold spell. In one part of the country there may be floods, while another part there may be drought. Apart from natural hazards, India faces intended and unintended terrorist attacks and technological hazards, which have been increasing recently. Technological hazards include the well-known Bhopal chemical disaster. India is also considered to be one of the most terrorist prone countries in the world. Examples include terrorist attack on the Indian parliament and in the Mumbai in Taj Hotel and other places in November 2008. There are 174 terrorist, insurgent, and extremist groups in India; many of the unknown groups are operating across the country, according to the South Asia Terrorism portal.[11]

A quasi experimental one group pretest posttest research design was conducted to assess the effectiveness of information booklet on knowledge of people regarding

Disaster Preparedness. Sample for the current study was selected according to non-probability purposive sampling technique consists of men and women between 21 to 50 years residing in diverse areas. Semi-structure questionnaire was used to assess the effectiveness of information booklet on knowledge about disaster preparedness of study samples. Descriptive and inferential statistics had been used for data analysis. The research was concluded with the information booklet improved knowledge of people regarding disaster preparedness. [12]

A questionnaire survey conducted among 444 residents of the city to examine seismic risk perception and investigate their levels of earthquake preparedness. The survey results suggest that an overwhelming majority of the respondents were not prepared for a major earthquake, which is anticipated to occur in Dhaka. Multivariate analysis of survey data reveals that value of residential unit and respondent educational levels appear as the most significant determinants of preparedness status of the respondents. This study recommends increasing earthquake awareness and preparedness among residents of Dhaka City.[13]

A survey on knowledge and awareness concerning chemical and biological terrorism was used to assess the knowledge base of health care providers at an urban medical center in preparation for developing a workshop on domestic terrorism preparedness. A total of 291 nurses, physicians, nursing students, and medical students completed the knowledge and awareness survey. The knowledge scores of the respondents were low, with less than one fourth of the knowledge questions answered correctly. These findings indicate a need for nurses in continuing education.[14]

A study was conducted to assess and evaluate the disaster management among 325 residents by using a structured interview questionnaire. The result of the survey indicates that, more than 90% of residents lacked tsunami knowledge. 10% of residents have tsunami knowledge. The school surveys reveal that; about 30 % of school children do not yet understand what causes a tsunami; 90% of school children have a keen interest in studying natural disasters; comprehensive disaster education has not been provided; and audio-visual means are thought to be the most effective tool for disaster education. The survey of officials shows that; seminars and drills on natural disaster have not been conducted among general officials other than the military and police; measures need to be developed to safeguard the interests of tourists; and sirens, TV, and radio broadcasts are effective tools for disseminating disaster warnings to residents.[15]

A cross-sectional study was conducted to evaluate the factors associated with preparedness against an earth quake in Tehran city among 1195 people aged 15 years or older. The analysis shows that 1076 (90.0%), 1160 (97.1%), and 490 (41.0%) of the participants achieved half of the possible scores for the knowledge, attitude, and practice components, respectively. Furthermore, in multivariate analysis low knowledge ($p<0.001$), having a high-school ($p=0.033$) or lower education ($p<0.001$) and living in Northern high-risk regions ($p<0.001$) of the Tehran were identified as risk factors for taking precautionary measures against earthquake In addition, people in the Southern high risk regions were significantly more knowledgeable (OR=0.618 compared to people in low risk regions). It is suggested that preparedness programs should aim at increasing public knowledge about earthquakes.[16]

A pilot study was conducted to assess the effectiveness of disaster conferences among 200 health care providers. The result has shown that among the 200 respondents, registered nurses (37%) and physicians (24%) were the largest categories of providers. Basic clinical care(39%) and triage (26%) were the most frequent response skills reported; the areas wherein respondents felt least prepared were disaster- specific response skills (22%) and systems issues (34%). Only 22% respondents reported that they did not know a specific skill. They made 495 individual recommendations for future responders, including actions to improve the respondent's personal preparedness (23%) and the need for training (25%). [17]

A study was conducted in emergency departments and health clinics in Selangor in Malaysia to determine knowledge, attitude and practice of emergency nurse and community health nurse towards disaster management. This was a cross-sectional study Questionnaire forms eliciting information towards disaster management were randomly distributed to 468 nurses working at the clinics. And the result was that both groups of nurses had similar inadequate knowledge but portrayed positive attitude towards disaster management. They differ in terms of practice whereby 56.1% of emergency nurses reported having had adequate practice compared to 30.7% of the community health nurses (chi-square test, $P<0.001$). Emergency nurses who have been involved in disaster response are more likely to report adequate practice ($P<0.01$, AOR=4.008, 95% CI=1.6919.504) while those who attended disaster-related education/training are more likely to have adequate knowledge ($P<0.05$, AOR=3.807, 95% CI=1.584-9.153) and practice ($P=0.001$, AOR=4.145, 95% CI=1.804- 9.525). Attending disaster-related education/training is seen to be a predictor to adequate knowledge among community health nurse. It is therefore paramount for health administrators to conduct disaster-related education/training nurses to improve their knowledge and practice towards disaster management.[18]

Nurses have been a part of disaster preparedness and response as long as nurses have existed. Modern understanding of nursing: attention to the injured or ill individual; assuring provision of water, food, clean dressings, and bedding; providing relief from pain; and offering a human touch that says "I care." Nurses have special role in advocating systematic profit-driven health

care services during disaster. Nurses are needed for prevention, surveillance, and response of every type. The great challenges nurses face in responding to natural, manmade, and technological disasters in comparison with the little times in teaching or learning this content during the basic nursing education program makes this study a timely one and relevant to the needs of nursing student as it provides further information that would somehow enhance knowledge, skills and attitude in relation to their future nursing career.[19]

Disaster management can be defined as the arrangements made to minimize the potential adverse effects of a disaster (Manitoba Health, 2000) which aims to create a safe environment and about the necessary healthcare services for victims throughout the disastrous event [20,21]

To develop a plan for natural disaster management, it needs the support of many kinds of professionals including nursing professional before math, during math, and aftermath (Stanley, 2005) [22]. An annual assessment of the emergency plan is required to assure emergency preparedness. Preparedness assessments should include: Elements of disaster planning. Emergency coordination; Communication; Training; Expansion of hospital surge capacity; Personnel; Availability of equipment; Stockpiles of medical supplies [23]

Disaster Nursing can be defined as the adaptation of professional nursing skills in recognizing and meeting the nursing physical and emotional needs resulting from a disaster. The overall goal of disaster nursing is to achieve the best possible level of health for the people and the community involved in the disaster.

"Disaster Nursing is nursing practiced in a situation where professional supplies, equipment, physical facilities and utilities are limited or not available".[24]

Kerala's climate is mainly wet and maritime tropical, heavily influenced by the seasonal heavy rains brought by the monsoon. Kerala receives an average annual rainfall of 3107 mm – some 7,030 crore m^3 of water. This compares to the all-India average is 1,197 mm [25, 26]. The State of Kerala is prone to a host of natural hazards such as coastal erosion, flood, drought, lightening, landslide and earthquake. All most all districts of Kerala are multi-hazard prone. In Kerala lightning, landslides (debris flows) and floods are the most commonly occurring natural hazards. Droughts and minor earth tremors also occur occasionally

Studies conducted in the state indicate that prolonged and intense rainfall or more particularly a combination of the two and the resultant persistence and variations of pore pressure are the most important trigger of landslides. All except 1 of the 14 districts in the state are prone to landslides. Wayanad and Kozhikode districts are prone to deep seated landslides while Idukki and Kottayam are prone to shallow landslides. A very recent study indicates that the additional cohesion provided by vegetation roots in soil is an important contributor to slope stability in the scarp faces of the Western Ghats of Kerala.[27, 28]

The objective of disaster preparedness is to ensure that appropriate systems, procedure, and resources are in place to provide prompt effective assistance to disaster victims, thus facilitating relief measures and rehabilitation of services. It includes all of the activities that need to be carried out prior to a disaster to ensure that disaster response activities run as smoothly as possible. Recognizing the urgent need to accelerate efforts to build the capacities of nurses in the midst of continued health threats and disasters, the ICN and WHO published "Framework of Disaster Nursing Competencies". More programs are needed to prepare and sustain an international workforce of nurses to undertake education and leadership roles.

The researcher was prompted to conduct a study among nurses regarding the **'**The Educational Intervention ***programme of Disaster Preparedness and Management" c***ompetencies as applied in disaster situations. Nurses will be a major component of the frontline response to any disaster preparedness planning and can reap benefits during the actual crisis. Crisis skills must be developed to ensure that when nation has the crisis we need to respond to the inevitable natural disasters and the increased risk of terrorism

With the increase frequency of disaster happenings globally, the need for education and training preparation is to be emphasized. A set of core competencies has also been defined as a starting point for delineating expected competency of health Nurses should be well adequately prepared with knowledge and skills for management of disasters, starting early from their basic training and reinforcement in their on-the-job continuing training. Nurses, in all specialties, should be equipped for all competencies for disaster prevention, preparedness, response, and recovery phases.[29] disaster plans need to be updated regularly to allow for system changes and all health staff should reflect this and be provided regularly so that health professionals are kept abreast of the newly and latest changes and orders.[30]

MATERIALS AND METHODOLOGY

Research approach

This study was conducted in 2016-2017. The research approach adopted for this study was quantitative approach

The research design

The research design adopted for the present study was pre experimental research with one group pre-test post-test method

The design can be abbreviated as:

O1 x O2

O1 – pre-test

x -Educational Interventional programme

O2 – post-test design.

Variables under the study are:

Independent variable: Planned teaching programme.
Dependent Variable: Knowledge, and awareness of nursing personnel regarding disaster preparedness and management

SETTING OF THE STUDY
This study was conducted in selected district of Kerala in the health care setting of hospitals, nursing colleges and schools.

POPULATION OF THE STUDY
Nurses working at the hospitals, nursing colleges and schools in selected, at the high risk disaster zones of Kerala

SAMPLING TECHNIQUE:
A total of 400 respondents were 400chosen for the study based on subjects who fulfilled the inclusion criteria Purposive non Random sampling was utilized in order to get the sample respondents in the said different areas of specialization.

DATA GATHERING INSTRUMENTS
A self-made questionnaire was used as the major tool in gathering the data needed for the study. The tools were prepared based on review of literature on related studies, non-research literatures and internet support.

It was divided into four parts; the first was the respondents' demographic profile in terms of age, gender, religion, year of service and area of specialization. Consecutively, the other parts focused on the nurse's knowledge regarding various types of disaster, preparedness and management before, during and after disaster.
Section 1: A Socio demographic data sheet
Demographic data sheet consists of variables such as age, education, occupation, socio economic status, marital status, years of experience and the category of the Institution they are employed
Section B: Details regarding the type of the training programmes that the nursing personnel have attended.
Section C: Structured Questionnaire regarding the knowledge of different types of disaster and also about its management and prevention

The structured knowledge questionnaire regarding different types of disaster like, Flood, Cyclone, Landslide, Avalanches, and Drought etc. and also about its management and prevention before and after Educational Interventional programme. Each correct answer was given 1 mark; wrong or unanswered questions were given no score.

Tool 3: Structured Questionnaire regarding the regarding various role of the nurses on preparedness and management of disaster situation of the nursing personnel before and after Educational Interventional programme. Each correct answer is given 1 mark; wrong or unanswered questions were given no score. The questionnaire was provided with a clear direction instructing to the respondents and the right four answers was given a score of 1 and the wrong response was given a score of 0
Pilot study: A pilot study was conducted on 10% of study sample to evaluate the developed tools for clarity and applicability then necessary modification was made. Data collection: Data collection was extended from September 2016- March 2017.
The study was conducted in four phases

DATA GATHERING PROCEDURE
Medical Directors of selected hospitals and clinics were met. After receiving their approval investigator personally disseminated the questionnaire to the respondents and assured them their anonymity. The structured teaching programme was conducted by Lecture, discussion methods using various Audio-visual aids like by means of power point, videos. After the retrieval of the filled up questionnaire the data were tailed, tabulated and interpreted using statistical measures by the statistician

PLAN FOR DATA COLLECTION: The ethical clearance was obtained and the permission was taken from the higher authorities like Government of Kerala (Health &Family Welfare Department), concern authority of the hospitals, nursing colleges and schools for conducting the study.
Phase 3: The follow up among the study samples was done, after 15 days via contacting through Emails, personnel contact, and through telephonic contact. Based on the convenient of the Nurses duty of the Institutions the Educational Intervention programme was conducted for 3 hours in order to create awareness among the female nurses regarding different types of disaster, Nurse's role of disaster preparedness, management in order to improve their knowledge and practice in managing disaster situations.

The researcher implemented structured Educational interventional programme, by using variety of teaching methods like Lecture, Discussion, Videos, power point presentation and Educational Booklet were distributed to the participants and to the Institution.

Phase 4: Post test was conducted among the samples, after1 month of educational intervention to assess the knowledge of nurses regarding different types of disaster, Nurse's role of disaster preparedness and management, by using the structured questionnaire.

Data analysis: Data were analyzed and interpreted in the light of the objectives using both descriptive and inferential statistics. Demography data and the details regarding the training programmes that the nursing personnel have attended was analyzed by using Frequency and percentage distributions and presented in the form of tables and graphs

Inferential statistics helps in drawing inferences from the data like, finding the differences, relationship and association between two or more variables. The most commonly used inferential statistical tests are Z- test, t-test, ANOVA, chi- square tests etc. The test of significance paired' test was used to find out the effectiveness of structured teaching programme. Chi-square test was used to find out the association between pre-test knowledge with selected demographic variables.

It was evident from the above graph that there was significantly better knowledge mean score, with the standard deviation regarding the awareness of Drought during the post-test after the Educational interventions comparing the pre-test values

The aim of this present study to provide an overview of the nurse's role on disaster preparedness and management among the Female Nurses working in Health Facility in Disaster Prone Areas of Kerala before and after the structured teaching programme

RESULTS AND FINDINGS

General characteristics of the study subjects:

Demography profile of Respondents: Figure 1-4 shows the important demography variable profile of respondent's Educational status, Age, Marital status, Religion, Occupation, years of experience, Institution they are employed and the place of the Residency. The present study results revealed among 400 subjects the educational qualification of respondent's majority of 188(47.0%) were BSc Nurses, 173(43.2%) did General Nurse and midwifery and 39(9.8%) were MSc nurses. Studies had find that higher educational attainment enhances disaster preparedness.:[31]

Majority of respondents were between 307(76.8%)20-30 years of age, followed by 78(19.5%) between 31-40 years of age and 15(3.8%) were more than 41 years of age. This is similar to study done by Chan (2005) showed that nurses who were young (26-30 years) had lower levels of knowledge than older adults (31-40 years) in clinical management systems. Regarding the Marital status of the respondent's majority of the subject 284(71%) were married and living together and 116(29%) were single, even the Divorce respondent have mentioned as single. Concerning the work part of the study subject's majority of the respondents were staff nurses or working as clinical instructors 319(79.8%), 42(10.5%) were ward in charges and only 39 (9.8%) were post graduate faculty working as teachers.

The study of De la Cruz (2009) noted a significant relationship between the nurses' demographic profile variables and their performance of nursing functions. More specifically, she identified a close level of performance among nurses grouped by age, educational attainment, civil status and length of experience in the nursing profession. Further, a research by Wendt and Alexander (2007) found that client care provided by nurses was largely the same across the spectrum of specialties, years of experience, geographic region, and facility[32]

Frequency and Percentage Distribution of Disaster Training

Among the 400 subjects Majority of the respondents 350(87.2%) have not undergone any formal training programme of disaster management, only 50(12.5%) had participated in the training programme. majority of the respondents 361(90.2%) haven't taken part during the time of disaster.334 (83.5%) haven't participated in the mock drill training and only 66(16.5%) had participated. Similar to the present study results regarding the low awareness of respondents of the disaster plan, O'Sullivan *et al.* (2008) indicated that nurses felt unprepared to respond to large scale disasters. Therefore, it was recommended that more training and information were needed to enhance preparedness for frontline health care workers.[33]

Awareness level of various category of disaster among the study respondent before and after the structured teaching programme

The knowledge of the Nurses regarding various aspects disaster before and after the Educational interventional strategy Respondents awareness regarding various aspects of the disaster terms, definition, types, and about the disaster prone district in Kerala. It shows generally low awareness about all the Items in the pre-test score but the analysis of the post-test reveals higher score in the Mean, Standard deviation value in all the category of the disaster related item after the educational intervention with the highly significant p value. ($p< 0.001$)

Regarding the definition pre-test mean score of respondent was only 16% with the standard deviation of 3.67.Evan though being the Nursing personnel majority of them were not aware of the definition of disaster. Comparing with the post-test mean score there was increase in the knowledge level of 81%, standard deviation 3.93. The pre-test mean score of the respondent regarding the Hazards of Disaster was 23%with the standard deviation 4.23 whereas the post-test mean score was 63%, standard deviation of 4.84. About the types of disasters of in India more than half of the respondent were aware the mean score value was 54 %with the standard deviation 4.99 There is significant increase in the post mean score of 92%, standard deviation 2.07.

The pre-test mean score of the respondent about the types of natural Disaster was 48%with the standard deviation of 5.00. In the post test mean score was 90% with the standard deviation 03.7 with p value<0.001. About the types of manmade Disaster the pre-test mean score was56 %with standard deviation of4.98. There is a significant difference in the pre and post-test mean score of 94%, standard deviation of 2.42.($p<0.00$). The present study findings have revealed statistical significant

improvement in post-test phases after the educational interventional programmes using different method of teaching and the application of the guidance booklet. As it was defined by Veenema, a disaster is "any event where the demand exceeds the available resources. This means that nurses need to be prepared to deal with all hazards. whereas in the study carried out in Philippine he identify that most of the participants(81.3%) in the disaster simulation training in hospitals.73.3% and Copnell (2015) concluded on the basis of their quantitative study that Nurses must have sufficient knowledge in all extents of disaster management especially in responding to disasters which is similar to our study findings that the pre-test mean scores of all the general aspects of disaster shows significance deficiency before the Educational Intervention.[34,35,36]

Awareness of respondent about Tsunamis before and after the Educational interventions

The table No illustrates the respondent pre-test mean score with standard deviation regarding the types, causes and run up of tsunami reveals 64(4.80),41(4.92),48(50), whereas the post-test was 90(3.04),89(3.13),89(3.13) respectively. Which is highly significant (p=0.01).Recent occurrences of major earthquakes and tsunami, such as the Indian Ocean tsunami in 2004, the 2009 Samoa earthquake, and the Japan tsunami in 2011 have challenged the resilience and preparedness of the affected nations, with many communities still recovering from the disasters. The Indian Ocean tsunami demonstrated how unpreparedness made regions vulnerable, as it resulted in the death of at least 230,000 individuals and 2.9 billion dollars in damages [37]

In an article written in *The Lancet*, quotes Gerard Fryer, a geophysicist at the Pacific Tsunami Warning Centre, "for the people within the source region of the earthquake, they basically have to be educated. If the ground shakes, get away from the ocean". Education is vital, especially when a tsunami is generated from a local earthquake, because the tsunami may reach the shores before the warning reaches the community. If members of community are trained, people can respond to a long or strong earthquake more quickly than a warning can be communicated[38].

Awareness of respondent about Earthquake before and after the Educational interventions

EARTHQUAKE: Based on this study result the respondent pre-test scores reveals the mean score, standard deviation regarding the earth quake description, causes and risk reduction methods were 46(4.99),59(4.92), and 51(5.01), where a remarkable increase in the post test score of 88(3.22),92(2.72) and 92(2.72) indicating effectiveness of the Educational Interventional programme. There was significant difference in the pre-test and post –test scores with p value 0.001. Regarding the pre -test and post-test, mean score with standard deviation of the respondents about the Earthquake hailing method, canine search and adverse effect reveals 44(4.97, 43(4.96), 58(4.95) and 89(3.13), 90(2.94), 91(2.87) respectively which was highly significant with p value 0.001following the Educational interventional programmes. Since 2004, the world has experienced several devastating tsunami resulting from earthquakes, including the Sumatra-Andaman Earthquake in 2004, the Samoa Earthquake in 2009, and the Tohoku Earthquake in Japan in 2011, responsible for numerous deaths and a great deal of destruction. Education programs have showed to be effective in minimizing the tragedy experience. The Sanriku coast in Japan is an area that has experienced large tsunami in the past [37] years that have resulted in a lower death ratio with each new tsunami.

Furthermore the present study is supported by to assess the effectiveness of disaster conferences among 200 health care providers. The result has shown that among the 200 respondents, registered nurses (37%) and physicians (24%) were the largest categories of providers. Basic clinical care (39%) and triage (26%) were the most frequent response skills reported; the areas wherein respondents felt least prepared were disaster- specific response skills (22%) and systems issues (34%). Only 22% respondents reported that they did not know about specific skill. They made 495 individual recommendations for future including actions to improve respondent's personal preparedness (23%) and need for training (25%).[40] The present study result of Tsunami, earthquake findings knowledge level was less than average, whereas comparing the pre-test score there was high increase in the post-test knowledge score of the Nursing personnel with the statistical p value of 0.001. Because the researcher organized Educational Intervention was implemented by using various teaching methods like lecture, discussion with PowerPoint presentation videos regarding Natural, Manmade disaster and also study subjects were given a highly informative booklet which has helped them to gain better insight about the minor disaster.

Awareness of respondent about Drought before and after the Educational interventions

It was evident from the Figure 5 that there was significantly better knowledge mean score, with the standard deviation regarding the awareness of Drought during the post-test after the Educational interventions comparing the pre-test values . There was statistically significant differences of the study subjects regarding the definition, types and causes of drought, the pre-test score, standard deviation were 41(4.93), 37(4.84), 44(4.98) meanwhile the post-test had the highest scores of 90(3.04), 89(3.13), 88(3.22). There was a significant difference in pre-test and the post test scores at p<0.001 level. The respondents mean pre-test score with the standard deviation regarding the drought consequences, Metrologic drought and goals of drought were 58(4.45), 44(4.91),

20(4.01) and post test score was 91(2.87), 88(3.28), 76(4.29the increase in the knowledge level indicates the effectiveness of Interventional programme with significant p value level (0.001). It was evident that there was significantly better knowledge score in the post test with p value level (0.001).

India faces huge problem due to drought about 68 percent of arable land in India is vulnerable to drought. Human activity can directly trigger exacerbating factors such as farming, excessive irrigation, deforestation, and erosion adversely impact the ability of the land to capture and hold water. Besides that, Ojha *et al*. predicted that drought events were expected to increase in the west central, peninsular, and central northeast regions of India in 2050–2099.41 Considering drought impact, Subash and Mohan found that the monthly distribution of monsoon rainfall in terms of Standardized Precipitation Index (SPI) accounted for a 44% yield variability in rice. [41, 42, 43]

Recent studies analyzed drought trends and variability in India for the period 1901–2004[34]. Results indicated an increasing trend in drought severity and frequency. More regional droughts in the agriculturally important southern coast India, central Maharashtra, and Indo-Gangetic plains were also highlighted indicating higher food security and socioeconomic vulnerability. However, this preliminary study only focused on precipitation-based meteorological drought. In addition, it was recognized that while drought stress could be identified, the implications on crop production required a more comprehensive consideration. Considering drought impact, the monthly distribution of monsoon rainfall in terms of Standardized Precipitation Index (SPI) accounted for a 44% yield variability in rice.[44] While India has strong drought assessment capabilities, it is important for the nursing personnel to understand the Drought management programme of the country to empower the community because there is need to enhance capacity for early warning and impact monitoring, particularly in the light of climate change impacts, because of wide variability in rainfall pattern even at local levels. Although agro met advisories to help farmers adopt appropriate agricultural practices are to be issued on a weekly and bi-weekly by the local governments, there is a need to enhance medium and long range forecast capabilities. Effective and timely coordination among various Ministries/ Departments/ Organizations can enhance the drought management results [45]

Effective and collaborative implementation of drought relief programmes. Strengthening effective water and commodities supply system. Disaster management includes four phases: mitigation, preparedness, response and recovery .Mitigation includes any activity taken to prevent the occurrence of the disaster whenever possible Preparedness is defined as activities and measures taken in advance of an event to ensure effective response to the impact of hazards [4]. A single drought event impacts an average of 75 million people –Drought is recurrent in the Rajasthan, Gujarat and Maharashtra state, has a widespread impact on people's livelihood, food security, and health. There has been a paradigm shift to relief-centric response to a proactive prevention, mitigation and preparedness-driven approach for conserving developmental gains and also to minimize loss of life, livelihood and property. Effective and timely coordination among various Ministries, Departments and Organizations can enhance the drought management results.[46]

Roles of the nursing personnel during various stage of disaster Preparedness and Management before and after the teaching program.

Regarding the respondent's pre-test mean score, standard deviation was relatively low about measures to reduce disaster, immediate responsibility in response phase, goals of treating mass causality, and the importance of Triage victim were 50[5.01],36[4.82],49[5.01],

44(4.98)whereas the post-test mean score, standard deviation was relatively high89 [3.10], 88[3.19], 90[2.98], 88(3.28) due to the effectiveness of Educational Intervention. There was a significant association of the respondents pre and post-test score with p value <0.001. The Knowledge of the respondents mean score , standard deviation regarding the major cause of injury, rapid assessment of the victim, common aspects fails during disaster, disaster agent, and factor affecting the host during disaster, reveals low value such as 30(4.60), 51(5.01) 52 [5.00],54 [4.99],47[5.00]) whereas a significant difference was in the post test score as 59(4.92),88 (3.26)902.97], 88[3.19],88[3.22] with P value at 0.001.

Nurses' awareness related to the various stage of disaster was less than average the present study findings have revealed statistical significant improvement after the Educational Interventional programme and guidance booklet. The result is in agreement with O'Sullivan et al. WHO recommended that more training and information were needed to enhance preparedness for frontline health care workers, and of important members of the response community.

The findings regarding health problem is similar to the study conducted on mental health and psycho-social aspects in disaster preparedness in Nepal. But mental health and psycho-social relief is not adequately addressed in this plan. They concluded that further strengthening of the mental health and psycho social aspects of disaster preparedness is needed[47].

Response phase is the point at which actions are started to save lives, property, and the environment to prevent secondary harm The goal of disaster management includes prevention of the occurrence, minimizing casualty number, preventing further casualties, rescuing the injured, providing first and evaluating the injured, and providing definitive care and facilitating reconstruction recovery

The present finding regarding nurses' awareness related to the various stage of disaster was less than

average, statistical significant improvement was observed in post-test phases after the educational interventional programmes which is similar to study conducted by Fung et al. (2008) also found that almost all nurses (97%) perceived themselves to be inadequately prepared for disastrous events due to a lack of training and education related to disasters. A systematic review on the effectiveness of disaster training for health workers by Williams et al. (2008) also clarified these statements. Regular training, particularly related to disasters and emergencies is recommended for nurses to improve their own practice in clinical settings and to help them better to perform in their current roles, functions, and to improve competencies when managing disasters [24]

Association of the demographic variable with the disaster aspects

Figure 1-4 describes about the association of the demographic variable of Age, Education occupation and Years of experience of the study subjects at 0.05 and 0.01 level of significant

Table No 5 depicts that there is no significant association of the nurse' knowledge regarding various disaster characters at (p value<0.0 5) with age.

Table No 6 revels there is a significant association of the knowledge of nurse' regarding various role of disaster management with the education at 0.007 (p<0.01**). There is no significant association of the knowledge of nurse' regarding various disaster characters, Tsunami, Earthquake, Drought and its prevention strategy with the education at
(p value<0.0 5).

Table 7 reveals no significant association of the knowledge of nurse' regarding various disaster characters, Tsunami, Drought and its prevention strategy with the Marital status at
(p value<0.0 5) .There is significant association of the knowledge of nurse' regarding Earthquake and its prevention strategy with the paired t" test (.048, 0.045, p<0.05 *) with the Marital status

Table 8 shows a significant association of Tsunami, and its prevention strategy (0.016, p value<0.05*)with the occupation. There is no significant association of the knowledge of nurse' regarding various disaster characters, Earthquake, Drought and its prevention strategy with the occupation at(p value<0.0 5).

RESULTS

Distribution of Demographic Variables (N: 400)

Figure 1: Educational wise Frequency distribution of nursing personnel

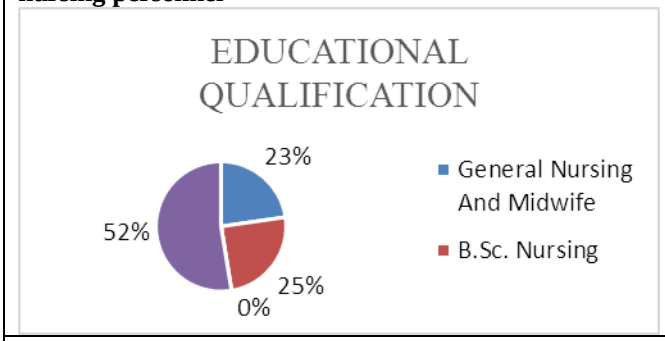


Figure 2: Age wise percentage distribution of nursing personnel

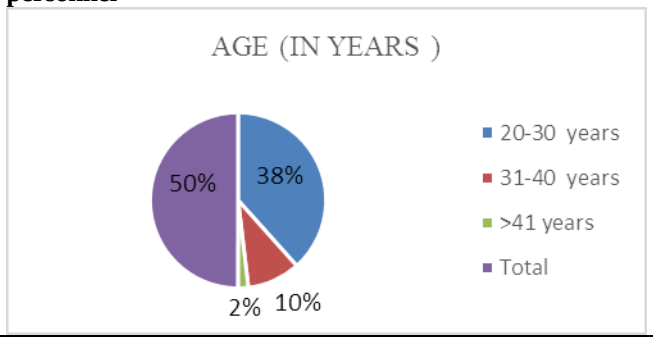


Figure 3: Marrital status wise Frequency distribution of nursing personnel

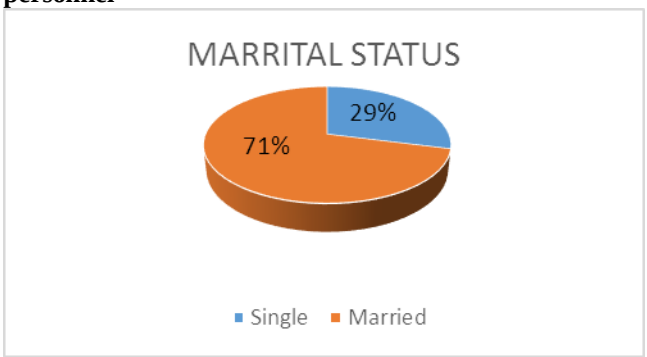


Figure 4: Occupational status wise Frequency distribution of nursing personnel

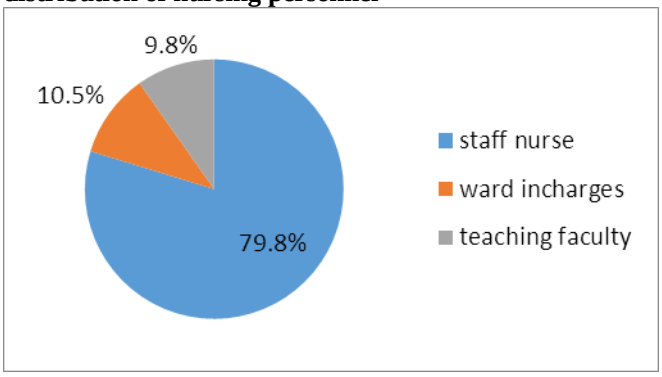


Table 1: Frequency and Percentage of Respondent regarding the Disaster Training programme (N: 400)

Category of Disaster Training	Responses	No.of respondents	Percentage
Formal Training Programme	Yes	50	12.5
	No	350	87.5
	Total	400	
Participation in real time Disaster	Yes	39	9.8
	No	361	90.2
	Total	400	
Participation in Mock Drill	Yes	66	16.5
	No	334	83.5
	Total	400	

Table 2: Respondent Awareness regarding various aspects of disaster before and after the Educational interventions. (N: 400)

Disaster related characters	Pre test	Standard deviation	Post test	Standard deviation	t Value	P value
Most vulnerable continent	56	4.97	95	2.18	14.83	0.001**
Percentage of H2O surface	38	4.87	84	3.62	17.73	0.001**
Meaning of disaster	53	5	93	2.6	14.67	0.001**
Awareness of disaster	16	3.67	81	3.93	24.21	0.001**
Hazards Awareness	23	4.23	63	4.84	12.41	0.001**
Common disaster in India	54	4.99	92	2.75	14.4	0.001**
Disaster prone district in Kerala	53	5	88	3.25	11.87	0.001**
Common disaster in Kerala	65	4.77	50	5.01	4.79	0.001**
Types of natural disaster	48	5	90	3.07	14.28	0.001**
Types of manmade disaster	56	4.98	94	2.42	14.7	0.001**

P Value <0.001 *significant at5%significant at 1% level**

Table 3: Respondent Awareness regarding Tsunami and Earthquake before and after the Educational interventions

Disaster related characters	NO. of subjects	Pre-test score		Post test score		P value
		Mean	Standard deviation	Mean	Standard deviation	
Types of tsunami	400	64	4.80	90	3.04	0.001**
Causes of tsunami	400	41	4.92	89	3.13	0.001**
Run up means	400	48	5.00	89	3.13	0.001**
Earthquake	400	46	4.99	88	3.22	0.001**
Causes of earthquake	400	59	4.92	92	2.72	0.001**
Risk reduction method	400	51	5.01	92	2.72	0.001**
Hailing method means	400	44	4.97	89	3.13	0.001**
Canine search	400	43	4.96	90	2.94	0.001**
Effect of earthquake	400	58	4.95	91	2.87	0.001**

P Value <0.001 *significant at5%significant at 1% level**

Table 4: Respondent Awareness regarding role of nurses in various stages of disaster management before and after the Educational interventions

Disaster related characters	NO. of subjects	Pre-test score		Post test score		P value
		Mean	Standard deviation	Mean	Standard deviation	
Measures to reduce the severity of	400	50	5.01	89	3.10	0.001**

disaster						
Responsibility during Response Phase	**400**	**36**	**4.82**	**88**	**3.19**	**0.001****
Goals of the mass causality	**400**	**49**	**5.01**	**90**	**2.98**	**0.001****
Triage of victims	**400**	**44**	**4.98**	**88**	**3.28**	**0.001***
Major causes of the injury	**400**	**30**	**4.60**	**59**	**4.92**	**0.001***
Rapid assessments of the victims	**400**	**51**	**5.01**	**88**	**3.26**	**0.001***
Aspects fails during disaster	**400**	**52**	**5.00**	**90**	**2.97**	**0.001****
Disaster Agents	**400**	**54**	**4.99**	**88**	**3.19**	**0.001****
Host factor affecting during disaster	**400**	**47**	**5.00**	**88**	**3.22**	**0.001****

P Value <0.001 *significant at5%significant at 1% level**

Table 5: Association of the knowledge regarding various disaster characters with the age N = 400

Disaster aspects	Age	No	Mean	Standard deviation	Level of significance
Disaster character	**20-30 years**	**306**	**37.64**	**2.548**	**0.056^{NS}**
	31-40 years	**78**	**35.64**	**2.556**	
	>41 years	**15**	**43.33**	**3.754**	
Tsunami and its prevention strategy	**20-30 years**	**306**	**11.6**	**1.172**	**0.364^{NS}**
	31-40 years	**78**	**10.25**	**1.092**	
	>41 years	**15**	**14.66**	**1.302**	
Earthquake	**20-30 years**	**306**	**24.54**	**1.828**	**0.078^{NS}**
	31-40 years	**78**	**21.15**	**2.063**	
	>41 years	**15**	**32.66**	**2.153**	
Drought and its prevention strategy	**20-30 years**	**306**	**27.87**	**1.8**	**0.555^{NS}**
	31-40 years	**78**	**26.15**	**1.922**	
	>41 years	**15**	**31.33**	**1.884**	
Awareness of nurses in disaster management	**20-30 years**	**306**	**34.83**	**2.541**	**0.501^{NS}**
	31-40 years	**78**	**37.56**	**2.4**	
	>41 years	**16**	**40.66**	**2.016**	

P Value <0.001 *significant at5%significant at 1% level**

Table 6: Association of the respondent's knowledge regarding various disaster character with the educational status N = 400

Disaster related characters	Educational level	No	Mean	Standard Deviation	Level of significance
Disaster character	**GNM**	**173**	**38.61**	**2.825**	**0.515^{NS}**
	BSC	**187**	**37.27**	**2.455**	
	MSC	**40**	**33.33**	**2.216**	
Tsunami and its prevention strategy	**GNM**	**173**	**12.6**	**1.154**	**0.184^{NS}**
	BSC	**187**	**10.8**	**1.208**	
	MSC	**40**	**9.48**	**5.916**	
Earthquake	**GNM**	**173**	**25.37**	**2.072**	**0.141^{NS}**
	BSC	**187**	**24.33**	**1.762**	
	MSC	**40**	**18.71**	**1.625**	
Drought and its prevention strategy	**GNM**	**173**	**27.51**	**2.074**	**0.715^{NS}**
	BSC	**187**	**26.23**	**1.581**	
	MSC	**40**	**25.64**	**1.774**	
Awareness of nurses in disaster management	**GNM**	**173**	**39.19**	**2.48**	**0.007***
	BSC	**187**	**34.22**	**2.48**	
	MSC	**40**	**26.15**	**2.37**	

P Value <0.001*significant at5%significant at 1% level**

Table 7: Association of the respondent's knowledge regarding various disaster character with the Marital Status

N = 400

Disaster aspects	Character	No	Mean	Standard deviation	Level of significance
Awareness regarding disaster character	Single	115	33.91	2.462	0.082^{NS}
	Married	285	38.9	2.643	0.074^{NS}
Tsunami	Single	115	1.043	1.209	0.266^{NS}
	Married	285	1.186	1.142	0.278^{NS}
Earthquake	Single	115	2.313	1.682	0.048*
	Married	285	2.461	1.977	0.045*
Drought	Single	115	2.834	1.659	0.637^{NS}
	Married	285	2.739	1.891	0.618^{NS}
Awareness of nurse in disaster management	Single	115	51.39	2.898	0.149^{NS}
	Married	285	46.14	3.417	0.122^{NS}

P Value <0.001 *significant at5%significant at 1% level**

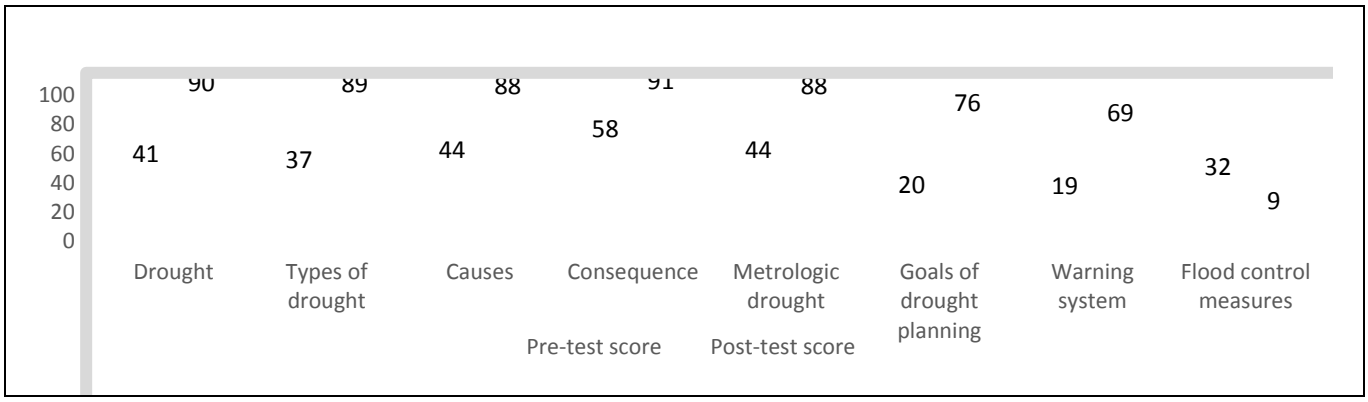
Table 8: Association of the respondent's knowledge regarding various disaster character with the Occupation

N = 400

Disaster character	Character	No	Mean	Standard deviation	Level of significance
Disaster character	Staff Nurses	319	37.68	2.672	0.947^{NS}
	Ward Supervisor	42	36.42	1.96	
	Teaching Faculty	39	36.84	2.651	
Tsunami and its prevention strategy	Staff Nurses	319	12.28	1.176	0.016*
	Ward Supervisor	42	8.33	0.881	
	Teaching Faculty	39	7.89	1.211	
Earthquake	Staff Nurses	319	2.514	19.66	0.099^{NS}
	Ward Supervisor	42	2.19	14.18	
	Teaching Faculty	39	1.868	16.63	
Drought	Staff Nurses	319	27.83	1.9	0.295^{NS}
	Ward Supervisor	42	24.04	1.515	
	Teaching Faculty	39	30.26	1.442	
Awareness of nurses in disaster management	Staff Nurses	319	47.7	3.4	0.997^{NS}
	Ward Supervisor	42	47.6	2.97	
	Teaching Faculty	39	47.2	2.45	

P Value <0.001 *significant at5%**significant at 1% level

Figure 5: Respondent Awareness regarding Drought before and after the Educational interventions.



CONCLUSION AND RECOMMENDATIONS:

This study finding reveals that the educational interventional programmes was effective in terms of improving the knowledge of the nursing personnel regarding the role of nurses during disasters in terms of preparedness, mitigation, response and recovery phase .Comparing the pre test scores, the post-test mean score, standard deviation was found highly significant, increase in the knowledge level indicates the effectiveness of Interventional programme with significant p value level (0.001)

- ❖ Therefore, Institution should develop policies for disaster management and pay more attention to the problem of disasters and preparedness for their management. Training programs are essential to increase their awareness about disaster management.
- ❖ Nurses regardless of variations in demographic profile, should always manifest a high sense of awareness to their roles during disaster, be prepared in critical situations and apply their management skills in facing different clients and situations.
- ❖ This study should be utilized to create awareness to all the nurses, nursing students and nursing educators by enhancing their profession's capability and competency through training and educational session.
- ❖ Allotment of more theory and practice hours for the curriculum of Nurse can be improving the competency of the nurse.
- ❖ Future research may be conducted a study similar or related to this present study to determine the effectiveness of the educational Interventional programme among the GNM, Bsc, and Msc Nursing students
- ❖ Similar study can be undertaken as comparative study between rural and urban nurse

The great challenges nurses face in responding to natural, manmade, and technological disasters in comparison with the little time spent in teaching or learning this content during the basic nursing education program makes this study a timely one and relevant to the needs of nurses as it provides further information that would enhance knowledge, skills and attitude in relation to their future nursing career and the need for education & training preparation is to be emphasized. The educational interventional programmes regarding disaster preparedness, management was founded very effective.

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The authors deny any conflicts of interest related to this study

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